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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,695	09/20/2005	Gosse Boxhoorn	008895-0314113	3528

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EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1795

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11/20/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/518,695

Applicant(s)

BOXHOORN ET AL.

Examiner

Rodney G. McDonald

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 34-83 is/are pending in the application.
- 4a) Of the above claim(s) 34-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 51-83 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Election/Restrictions

This application contains claims 34-50 drawn to an invention nonelected without traverse in the reply filed on December 14, 2007. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 51-55, 57, 66, 68, 71, 77, 79, 80, 81, 82 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. (U.S. Pat. 4,871,580) in view of Lauth et al. (U.S. Pat. 5,559,065).

Regarding claim 51, Schram et al. teach a method for depositing a layer on a substrate. (See Abstract) Introducing a substrate into a processing chamber. (Column 4 lines 56-61) Generating at least one plasma by at least one plasma cascade source. (Column 7 lines 12-15) Depositing at least one deposition material on the substrate under the influence of plasma. (See Abstract; Column 4 lines 64-68; Column 5 lines 1-12) Depositing at least a second deposition material on the substrate by at least a sputtering source. (Column 5 lines 33-38; Column 6 lines 53-65)

Regarding claim 52, Schram et al. teach the plasma passes at least partly through at least one passage of the at least one sputtering electrode to contact the plasma with the electrode. (Column 5 lines 33-38; Column 6 lines 53-65; See Figure 1)

Regarding claim 53, Schram et al. teach the deposition material supplied outside the at least one plasma source into the processing chamber to the plasma in the processing chamber. (Column 4 lines 64-68; Column 5 lines 1-12)

Regarding claim 54, Schram et al. teach at least one volatile compound of the deposition material supplied to the plasma for the deposition. (Column 4 lines 64-68; Column 5 lines 1-12)

Regarding claim 55, Schram et al. teach the volatile compound contains at least one precursor material which decomposes in the processing chamber in material to be deposited before the material has reached the substrate. (Column 4 lines 64-68; Column 5 lines 1-12; Abstract)

Schram et al. teach at least one sputtering electrode which comprises the deposition material arranged in the processing chamber and the plasma is contacted

with each sputtering electrode to sputter the substrate with material. (Column 5 lines 33-38; Column 6 lines 53-65)

Regarding claim 83, Schram et al. teach adjusting the substrate to a particular treatment temperature. (Column 4 lines 56-61)

The differences between Schram et al. and the present claims is that utilizing the apparatus for manufacturing a catalyst layer is not discussed (Claim 51), utilizing a deposition material comprising at least one catalyst material which after an activation treatment is catalytically active is not discussed (Claim 57), the substrate being substantially non-porous is not discussed (Claim 66), the substrate comprising at least one metal or alloy is not discussed (Claim 68), the substrate being substantially porous is not discussed (Claim 71), wherein the at least one catalyst material is nickel, copper, palladium, rhodium, platinum or iron or any combination thereof is not discussed (Claim 77), wherein a reducing is carried out at an elevated temperature for the purpose of reduction of the deposition material deposited on the substrate is not discussed (Claim 79), wherein the reducing step is carried out under the influence of hydrogen is not discussed (Claim 80), wherein an inert gas which contains hydrogen is supplied to the substrate for the purpose of the reduction is not discussed (Claim 81), and wherein the substrate is adjusted to a particular electrical potential by DC, pulsed DC and/or RF biasing is not discussed (Claim 82).

Regarding claim 51, Lauth et al. teach utilizing physical vapor deposition and chemical vapor deposition to form a catalyst layer. (See Abstract) The relevant metal oxide, nitride, carbide is sputtered in the presence of hydrocarbons, oxygen and/or

nitrogen in the process gas. (Column 2 lines 48-52) It follows since Schram et al. teach utilizing a gas such as a hydrocarbon and sputtering a metal target that one looking at Lauth et al. would know how to deposit catalyst layers in the apparatus of Schram et al. utilizing the teachings of Lauth et al. (See Schram et al. and Lauth et al. discussed above)

Regarding claim 57, Lauth et al. teach sputtering at least one catalyst material which after an activation treatment is catalytically active. (See Abstract; Column 2 lines 1-10, lines 45-52; Column 4 lines 35-39, lines 62-66)

Regarding claim 66, Lauth et al. teach the substrate to be nonporous. (Column 4 lines 17-18)

Regarding claim 68, Lauth et al. teach the substrate to be a metal. (Column 4 line 16)

Regarding claim 71, Lauth et al. teach the substrate to be porous. (Column 4 lines 17-18)

Regarding claim 77, Lauth et al. teach the catalyst material to be palladium, platinum, copper and rhodium. (See Abstract)

Regarding claim 79, Lauth et al. teach a reducing step carried out at an elevated temperature for the purpose of reduction of the deposition material deposited on the substrate. (Column 4 lines 35-39, lines 62-66)

Regarding claim 80, Lauth et al. teach the reducing is carried out under the influence of hydrogen. (Column 4 line 64)

Regarding claim 81, Lauth et al. teach a mixture of gas containing CO₂ and hydrogen for reducing. CO₂ is inert. (Column 4 lines 62-66)

Regarding claim 82, Lauth et al. teach the sputtering can be bias sputtering. A negative bias is applied to the substrate. This could be DC. (Column 2 lines 33-44)

The motivation for utilizing the features of Lauth et al. is that it allows for preparing coated catalysts in a simple manner. (Column 1 lines 66-68)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Schram et al. by utilizing the features of Lauth et al. because it allows for preparing coated catalyst in a simple manner.

Claims 56, 58, 59, 63, 64, 65, 70, 72, 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. in view of Lauth et al. as applied to claims 51-55, 57, 66, 68, 71, 77, 79, 80, 81, 82 and 83 above, and further in view of Loch et al. (CA 2,297,543).

The differences not yet discussed is providing at least one second source chosen from the group consisting of a second plasma cascade source, a plasma source, a vapor deposition source and a sputtering source is not discussed (Claim 56), where the deposition material comprises at least one carrier material which material is initially suitable to carry a catalyst material is not discussed (Claim 58), the at least one catalyst material and the at least one carrier material are depositing on the substrate by different sources is not discussed (Claim 59), the substrate comprising sheet material is not discussed (Claim 63), the substrate moving in the processing chamber at least in such a way that each time a different part of the substrate makes contact with the plasma is not

discussed (Claim 64), the substrate being brought from an environment into the processing chamber and discharge from the processing chamber to the environment while the deposition material is deposited on the substrate in the processing chamber is not discussed (Claim 65), the substrate being corrugated is not discussed (Claim 70), the carrier material being a metal is not discussed (Claim 72) and the carrier material comprising an oxidizing material is not discussed (Claim 73).

Regarding claim 56, Loch et al. teach utilizing plural gas sources which meets applicant's requirement for a second source. In this instant hydrogen and nitrogen gas sources would be the vapor deposition sources. (Page 5)

Regarding claim 58, Loch et al. teach the deposition material comprises at least one carrier material which material is suitable to carry a catalyst material. (Page 6 last paragraph)

Regarding claim 59, Loch et al. teach the at least one catalyst material and the at least one carrier material are deposited on the substrate by different sources. (Page 5 last paragraph; "sources")

Regarding claim 63, Loch et al. teach the material is sheet material. (Page 2 second paragraph)

Regarding claim 64, Loch et al. teach the substrate is moved in the processing chamber at least such a way that each time a different part of the substrate makes contact with the plasma. (Page 4 last paragraph; Page 5 paragraph 1)

Regarding claim 65, Loch et al. teach the substrate is brought from an environment into the processing chamber and is discharged from the processing

chamber to the environment while the deposition material is deposited on the substrate in the processing chamber. (Page 4 last paragraph; Page 5 paragraph 1)

Regarding claim 70, Loch et al. teach the sheet can be corrugated. (Page 2 paragraph 2; Page 9 paragraph 2)

Regarding claim 72, Loch et al. teach the substrate is metal. (Page 9 paragraph 2)

Regarding claim 73, Loch et al. teach the carrier material comprising an oxidizing material. (Page 6 last paragraph)

The motivation for utilizing the features of Loch et al. is that it allows for producing catalyst with large surfaces. (Page 2 top page)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Loch et al. because it allows for producing catalyst with large surfaces.

Claims 74-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. in view of Lauth et al. and Loch et al. as applied to claims 51-55, 57, 66, 68, 71, 77, 79, 80, 81, 82 and 83 above, and further in view of Carcia (U.S. Pat. 4,536,482).

The differences not yet discussed are where the carrier material comprising a semiconductor material (Claim 74), where the carrier material is an oxidized semiconductor material (Claim 75) and where the carrier material further contains a heat-conducting material (Claim 76).

Regarding claims 74, 75, the carrier material can be a semiconductor material or oxidized semiconductor material. (Column 2 lines 56-59; Column 2 lines 66-68)

Regarding claim 76, the carrier material further contains a heat-conducting material. (Column 2 lines 56-59; Column 2 lines 66-68)

The motivation for utilizing the features of Carcia is that it allows for producing catalyst with good catalytic activity and selectivity. (Column 2 lines 32-35)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Carcia because it allows for producing catalyst with good catalytic activity and selectivity.

Claims 60-62, 67 and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. in view of Lauth et al. as applied to claims 51-55, 57, 66, 68, 71, 77, 79, 80, 81, 82 and 83 above, and further in view of Carcia (U.S. Pat. 4,536,482).

The differences not yet discusses is where the sputtering electrode contains at least a part of both a catalyst material and a carrier material is not discussed (Claim 60), the sputtering electrode containing compressed powders of the catalyst and carrier materials to be deposited on the substrate is not discussed (Claim 61), the sputtering electrode containing an alloy of the catalyst material and the carrier material is not discussed (Claim 62), the substrate comprising at least one carrier material is not discussed (Claim 67), and wherein the deposition material is uniform in mixture is not discussed (Claim 78).

Regarding claim 60, Carcia teach utilizing a sputtering electrode containing at least a part of both a catalyst material and a carrier material. (Column 3 lines 7-21)

Regarding claim 61, Carcia teach the sputtering electrode containing powders of the catalyst and carrier materials to be deposited on the substrate. (Column 6 lines 34-40)

Regarding claim 62, Carcia teach the sputtering electrode containing an alloy of the catalyst material and the carrier material. (Column 3 lines 7-21)

Regarding claim 67, Carcia teach the substrate comprising at least one carrier material. (Column 2 lines 53-59)

Regarding claim 78, Carcia teach the deposition material uniform in mixture. (Column 3 lines 22-25)

The motivation for utilizing the features of Carcia is that it allows for producing catalyst with good catalytic activity and selectivity. (Column 2 lines 32-35)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Carcia because it allows for producing catalyst with good catalytic activity and selectivity.

Claims 69 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. in view of Lauth et al. as applied to claims 51-55, 57, 66, 68, 71, 77, 79, 80, 81, 82 and 83 above, and further in view of Cairns et al. (U.S. Pat. 3,969,082).

The differences not yet discussed is the substrate is FeCrAlloy is not discussed (Claim 69) and the substrate being a corrugated material is not discussed (Claim 70).

Regarding claim 69, Cairns et al. teach FeCrAlloy as a substrate for carrying catalytic material. (Column 3 lines 1-9)

Regarding claim 70, Cairns et al. teach the substrate being corrugated. (Column 3 lines 7-9)

The motivation for utilizing the features of Cairns et al. is that it allows for providing a substrate that meets a severe environment. (Column 1 lines 39-43)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Cairns et al. is that it allows for providing a substrate that meets a severe environment.

Response to Arguments

Applicant's arguments filed July 22, 2008 have been fully considered but they are not persuasive.

In response to the argument that Schram do not teach or suggest "contacting the plasma with the at least one sputtering electrode to sputter the substrate with the second deposition material of the at least one electrode for depositing the second deposition material simultaneously with the first deposition material on the substrate.", it is argued that in Schram the plasma of the plasma jet contacts the sputtering electrode 6 to release material such that the vapor and the sputtered material mixes and the materials deposit simultaneously on the substrate 9. This is similar if not the same Applicant's invention. For instance Fig. 1 of Applicant's disclosure is identical to or similar to Schram et al. 's apparatus and achieves the same affect that Applicant desires. While Applicant argues the cited portions of Schram disclose that the particles

are mixed with the plasma jet after they have been freed from the solid-phase by a sputtering discharge, it is argued that the materials do indeed deposit simultaneously on the substrate 9 in Schram et al. (See Schram et al. discussed above)

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

RM
November 19, 2008